NON-CONFIDENTIAL

STATE OF MAINE
DIRIGO HEALTH AGENCY

IN RE:	)	EXHIBIT 1
	)	
DETERMINATION OF AGGREGATE	)	
MEASURABLE COST SAVING FOR	)	PRE-FILED TESTIMONY OF
THE FOURTH ASSESSMENT YEAR	)	ALLEN DOBSON, PhD
(2009)	)	
	)	
	)	
	)	July 9, 2008
	)	

NON-CONFIDENTIAL

1   Q.   Please state your name.

2   A.   Allen Dobson.

3   Q.   Please briefly describe your educational background.

4   A.   I earned a B.A., Economics, University of Washington in 1965 (Phi Beta Kappa), an

5   M.A., Economics, Washington University in 1968, and a Ph.D., Economics, Washington

6   University, St. Louis, Missouri in 1970.

7   Q.   In what capacity are you currently employed?

8   A.   I am currently the President of Dobson DaVanzo & Associates, LLC ("Dobson |

9   DaVanzo"). Prior to co-founding Dobson | DaVanzo, I was Senior Vice President of Health

10 Care Finance for The Lewin Group.

11 Q.   You will provide testimony today regarding your opinion of the savings methodologies

12 and estimates contained in the Report to the Dirigo Health Agency, Dirigo Health Reform Act:

13 Aggregate Measurable Cost Savings (AMCS) for Year 4 ("srHS Report"). What experience do

14 you have in this area?

15 A.   My consulting practice emphasizes analyses of hospital, physician, and other types of

16 provider payment issues as they relate to Medicare, Medicaid, workers' compensation, and

17 private payers. A copy of my current CV is attached hereto as **Chamber Exhibit 10**

18 **(hereinafter, "Chamber __")**. Some key highlights of recent or relevant projects include:

19 worked on an evaluation of Gov. Rendell's (PA) most recent healthcare reform proposal; led a

20 series of analyses on how Medicaid payment systems affect hospitals' profitability in

21 Massachusetts, Kentucky, Connecticut, Illinois and Pennsylvania; recently led a study on how

22 certificate of need ("CON") affected health care expenditures, and testified before a legislative

23 special commission this Spring on the impact of extending CON in the state of Illinois;

1 conducted a study concerning the University of Mississippi medical school's economic impact

2 on the State and how the State supports the University Medical School's bad debt and charity

3 care mission; started career with the national evaluation of professional standards review

4 organization which used econometric analytics similar to those employed in the Dirigo savings

5 analytics. I have spent my career using econometric technique in evaluation of social programs

6 and public policy issues and how econometrics influences public policy.

7 Q.   Are you familiar with hospital finance and the drivers that influence rates of cost growth

8 in the hospital industry?

9 A.   Yes. I've spent the past 20 years addressing how teaching activities effect hospital costs

10 in relationship to other hospital cost drivers. I was Research Director for Medicare when the

11 Inpatient Prospective Payment System ("IPPS") was designed and implemented. During this

12 time period I was also responsible for the Medicare Hospital Payment Division which conducted

13 all hospital finance research for Medicare. I have since emphasized hospital finance in my

14 consulting activities. I have studied the impact of Medicare IPPS and Outpatient PPS, various

15 Medicaid payment systems, and other Medicare prospective payment systems on numerous types

16 of providers. I also led and participated in American Hospital Association ("AHA") Trend

17 Watch Reports over a period of five or more years which were timely investigations of hospital

18 finance topics. In June of 2008, I provided comments to rehabilitation hospitals and nursing

19 home facilities on how CMS proposed regulations would influence future provider finance and

20 drafted a brief section on case mix index for the AHA.

21 Q.   Please briefly describe the steps that you took to prepare for this testimony.

22 A.   First, I reviewed what has been called the Dirigo Health Reform Act legislation as it

23 relates to the calculation of aggregate measurable cost savings or "AMCS" in this proceeding.

1   Q.   Just to clarify, you're not a lawyer are you?

2   A.   No, I'm not a lawyer, so I will leave the interpretation of the laws to those that are

3   lawyers.

4   Q.   What else did you do to prepare?

5   A.   I reviewed some of the testimony, exhibits and decisions from the prior DHA hearings in

6   order to gain a better perspective on the current proceeding, such as what savings methodologies

7   were used in the past, as well as the parties' and the Superintendent's criticisms of these

8   methodologies. Following this review, my team and I turned toward an analysis of the CMAD

9   and BD/CC savings methodologies.

10   Q.   First, please describe what Dirigo means to you.

11   A.   I understand that Dirigo is Latin for "I lead" and is the state motto of Maine. I also

12   understand that Dirigo is used by some as short-hand for the Dirigo Health Reform Act and the

13   Dirigo Health Agency. For the purposes of the srHS regression analyses, however, the meaning

14   of the "Dirigo" variable means the post-2003 time period. Recognizing this distinction is

15   critical because it is easy to infer that "Dirigo" refers to the Health Reform Act or the Health

16   Agency. Instead, methodologies that seek to measure any CMAD and BD/CC savings are really

17   measuring the post-2003 time periods, not the Act itself.

18   Q.   What do you mean by that?

19   A.   srHS implies that the Dirigo variable is a Maine specific effect that produces Maine

20   specific "savings." However, as used in the regression analyses, the Dirigo variable is simply a

21   pre-Dirigo (2000-2003) and post-Dirigo (2004-2007) time trend that applies to all hospitals in

22   the country. Therefore, the Dirigo variable is essentially a variant of a time trend analysis, not a

23   program effect analysis. That is why their analysis is misleading.

1 Q.   Let's start with CMAD. What type of analysis did you and your team employ?

2 A.   First, we replicated the output of the srHS CMAD (cost per case mix adjusted discharge)

3 regression model to be certain that we achieved the same result using the srHS data and

4 regression methodology. Second, as I'll discuss in more detail later in my testimony, we tested

5 the hypothesis underlying the srHS recommended CMAD savings amount by performing various

6 tests using the data relied upon by srHS. Finally, we used the data provided by the Dirigo Health

7 Agency ("DHA") and data from the prior years' hearings to perform several reality checks with

8 respect to the srHS recommended CMAD savings.

9 Q.   Were you able to replicate the results of the srHS CMAD regression model?

10 A.   Yes. As evidenced by **Chamber 2**, we were able to use the srHS source data to exactly

11 replicate the srHS recommended CMAD savings. This is important because it demonstrates that

12 we understand the inner workings of their regression analyses and that our analyses used the

13 exact same data as srHS.

14 Q.   Please describe your analysis of the BD/CC methodology.

15 A.   We took a similar approach to our CMAD analysis. We attempted to replicate the

16 BD/CC regression methodology model using srHS source data and methodology, and were able

17 to produce similar, but not identical, results as of the date of this pre-filed testimony. We were

18 able to identify the steps and calculation made by Dr. Thorpe, and have replicated the

19 application of their regression findings to differentials that were identified as "savings" as

20 identified on **Chamber 3**,   Then we tested the hypothesis underlying the srHS recommended

21 BD/CC savings amount by performing various tests and using data provided by the DHA and

22 data from the prior years' hearings to perform several reality checks with respect to the srHS

23 recommended BD/CC savings.

5

CMAD

1

2 Q.   What were your findings with respect to the CMAD analysis?

3 A.   Before I address my specific findings, I believe it will be helpful to outline what it is that

4 the srHS regression methodology is attempting to do, and then provide a few descriptive

5 statistics that summarize the srHS data.

6 Q.   What is the srHS regression methodology attempting to do?

7 A.   According to the srHS Report, the CMAD methodology is attempting to estimate what

8 the CMAD for Maine hospitals would have been in the absence of the variable entitled "Dirigo."

9 If the cost per CMAD with the Dirigo time variable is lower than the estimate of cost per CMAD

10 without the Dirigo time variable, srHS asserts that the difference is attributable to the Dirigo

11 voluntary cost per CMAD limit. What is interesting here is that both CMAD figures used in the

12 srHS regression methodology are estimated. The typical process of comparing actual value to

13 expected value is not utilized, such as Ken Thorpe utilized in the bad debt / charity care analysis.

14 srHS uses those estimates to compare CMADs for two different periods in time, the non-Dirigo

15 period (which is 2000 to 2003), and the post-Dirigo period, (which is 2004 to 2007). This usage

16 confounds Dirigo as a program with Dirigo as a time trend which applies to the entire country as

17 well as to Maine.

18 Q.   Can you please explain your descriptive statistics?

19 A.   Certainly. The Table 1 compares Maine's average compound rate of growth to all other

20 states during the period covered by the srHS regression methodology.   The source data for this

21 table is the srHS U.S. Hospital Regression data (dha_dataset_18) and the results of our

22 calculation of the All Other States are contained in **Chamber 4.**

23

Table 1: Pre/Post-Dirigo Average Compound Rates of Growth:
Maine Compared to All Other State

	Pre-Dirigo (2000-2003)	Post-Dirigo (2004-2007)	Change Pre to Post-Dirigo
All Other States	5.3%	3.5%	1.8%
Maine Only	7.8%	4.3%	3.5%
Maine Less US Trend	2.5%	0.8%	1.7%

Q.   What is the importance of this table?

A.   It illustrates that cost growth in Maine has outpaced the average cost growth of all other

States in the Dirigo period (2004 -2007). It also shows that all states, including Maine,

experienced a reduction in the rate of cost growth in the Dirigo period (2004-2007). This is

strong evidence that the entire reduction in the rate of cost growth in Maine cannot be attributed

solely to Dirigo. In fact, this table suggests that more than half of the reduction in the rate of cost

growth in Maine is simply a reflection of a similar trend in all other states.

Q.   Are you suggesting that Dirigo is responsible for the difference in the trend rate between

Maine and all other states?

A.   Not at all. In fact, Table 2 below indicates that although the average compound rate of

cost growth fell for both Maine and other states during the post-Dirigo period (2004-2007),

Maine's statistics are anomalous. The rate of cost growth for Maine peaked in 2001, and began

to fall dramatically in the pre-Dirigo period (2000-2003). In fact, the rate of cost growth

increased during the first two Dirigo Assessment Years (2004 and 2005), before settling back to
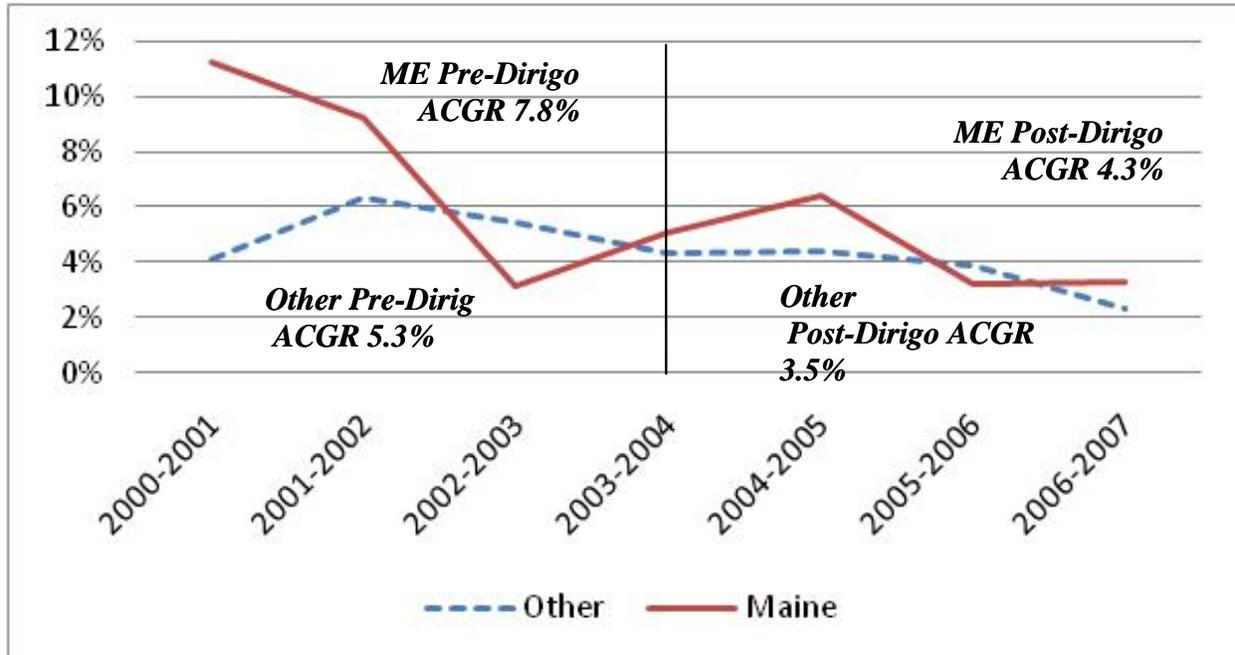
the 2003 (pre-Dirigo) level.

1   **Table 2: Percent Change (ACGR) in CMI Adjusted Discharge Cost Pre and Post-Dirigo**

2

3   Q.   What is the source for the data underlying this chart?

4   A.   Again, we have used the srHS cost per CMAD figures from 2000 to 2007 (from the U.S.

5   Hospital regression model) and weighted by national level minus Maine discharges at the facility

6   level to determine the average compound rate of cost growth. The spreadsheets that demonstrate

7   these calculations are set forth on **Chamber 4.**

8   Q.   If I understand Table 2 above, Maine's rate of cost growth began falling in 2001, well

9   before Dirigo was enacted and became effective in September 2003. What in your experience

10   could cause this?

11   A.   There are a myriad of drivers beyond national trend that may drive a particular state's

12   rate of cost growth when measured on a cost per CMAD basis, including overall economic

13   indicators such as employment levels, rate regulation, hospital competition, managed care

14   penetration, hospital physician relations, and operating margin. For example, I understand that

15   Maine hospitals were regulated by the Maine Health Care Finance Commission ("MHCFC"), a

8

1   rate regulation entity, from the mid 1980s to the mid 1990s. It has been noted that hospitals

2   often play "catch up" following the removal of rate regulations, and the peak in 2001 followed

3   by a natural regression to the mean would be consistent with this finding. In addition, in the mid

4   to late 1990's managed care organizations achieved significant penetration in the hospital

5   market. In the late 1990s and early 2000s, attitudes toward managed care shifted, resulting in

6   greater bargaining power in favor of hospitals. Again, it has been shown that hospitals played

7   "catch up" once managed care organizations lost their leverage, and the timing of the peak and

8   regression to the mean is consistent with this time period.

9   Q.   What else do your descriptive statistics illustrate?

10   A.   With respect to the peak cost growth in 2001, it appears that Maine hospitals were

11   playing "catch up" in the early 2000s. For example, in 2000, Maine's weighted statewide

12   average cost per CMAD was below the national average, as illustrated by the Table 3 below.

13   The Maine hospitals' CMAD surpassed the national average in 2001-2002, and thereafter it

14   began regressing back toward the mean in 2003, the year before Dirigo. During the post-Dirigo

15   period (2004-2007), Maine hospitals' weighted average cost per CMAD have actually outpaced

16   the national weighted average.
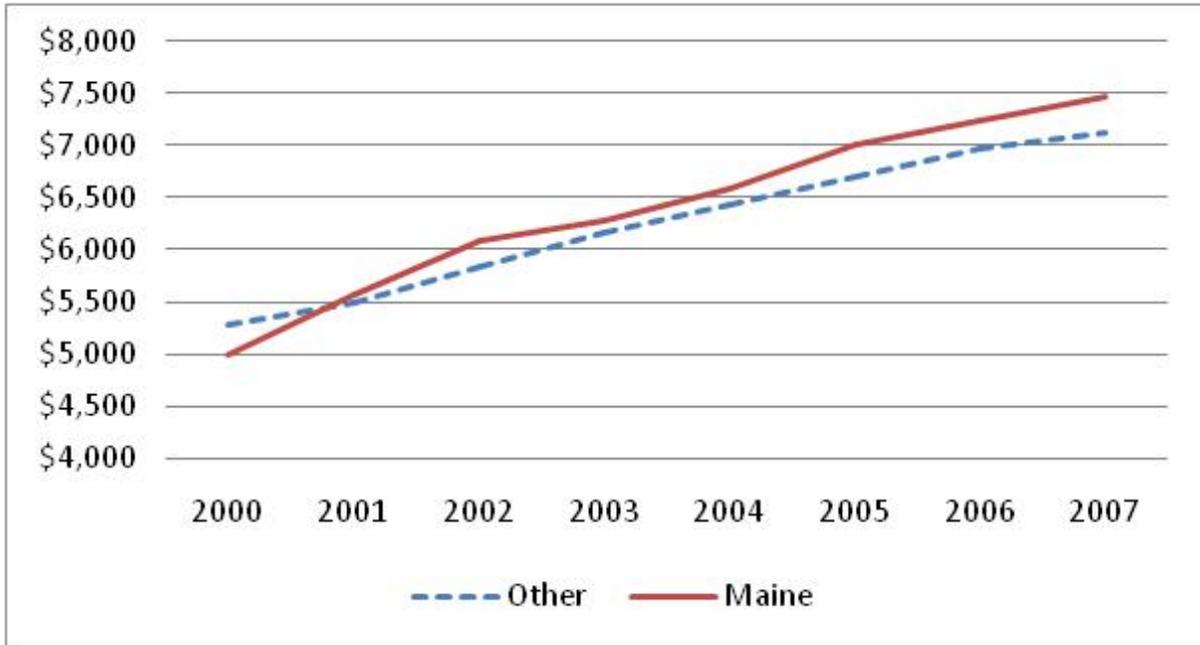
17

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23

1   **Table 3: Weighted Average CMI Adjusted Discharge Cost Pre and Post-Dirigo**

2

3   Q.   What is the source for the data underlying this chart?

4   A.   We used the srHS cost per CMAD data "dha_dataset_18" and weighted it in the exact

5   same manner as srHS did when weighting the cost per CMAD figures set forth in Table 1 on

6   page 54 of the srHS report. The calculations supporting this Table are contained in **Chamber 4**.

7   Q.   Taken together, what do these descriptive statistics tell you as an economist?

8   A.   These statistics indicate that the Dirigo Health Act voluntary cost per CMAD limit did

9   not have the type of impact suggested by the recommended savings of $147.9 million. The rate

10   of cost growth in Maine was on a downward slope well in advance of the Dirigo Health Act, and

11   the single largest year-to-year reduction throughout the entire period of 2000 - 2007 occurred

12   from 2002 to 2003 (Fiscal Year Ending June 30), a time before the Dirigo Health Act was

13   enacted and effective. I would also emphasize that the rate of cost growth actually increased

14   following the Dirigo Health Act's enactment, between 2003/2004 and 2004/2005. These

15   descriptive statistic observations are contrary to the srHS hypothesis that the Dirigo Health Act

1   can be the only explanation for a reduction in cost growth in Maine. It is against this statistical

2   backdrop that the srHS interpretations of the CMAD regression methodology results should be

3   viewed. That is, if the descriptive statistics do not match the regression results, the interpretation

4   of the regression result must be very carefully considered in order to explain any apparent

5   anomalies.

6   Q.   Before we move onto your specific findings regarding the CMAD regression

7   methodology, can you briefly explain how a regression model is supposed to work and what it

8   shows?

9   A.   Regression analysis seeks to quantify the relationship of one variable (the dependent

10   variable) to another variable(s) (the independent variable(s)). Under the "least squares"

11   approach, a linear formula is derived by calculating the least variance from observed values and

12   predicted values. The applications of regression analyses include the forecasting of outcomes

13   and the identification of relationships between a dependent variables and potential independent

14   variables.

15   Q.   Are there any limitations?

16   A.   Multivariate regression analyses calculate the correlation between two or more

17   independent variables and a dependent variable. A common misconception is that regression

18   analyses measure cause-and-effect between the dependent and independent variables. However,

19   a regression analysis only shows association, not attribution or causality. Attribution must be

20   demonstrated through a plausible hypothesis, by discrediting alternative hypotheses or by

21   interpretation of the econometrics in light of associated descriptive statistics results.

22   For example, in this case, srHS assumes that the Dirigo Health Act causes the difference

23   between different CMAD estimates calculated from its regression equation. This is an

1   interpretation that must be demonstrated. The Dirigo variable is defined as any period after 2003

2   in the srHS analyses. However, as explained below, this means that other states can and do show

3   a Dirigo Health Act "savings" effect. This is, of course, not plausible from a programmatic

4   perspective, because a Maine voluntary cost per CMAD limit cannot influence hospitals in, say,

5   a Midwestern state. However, other states actually show a strong Dirigo variable time trend.

6   **Chamber 4 and 5.** This must be considered when attempting to delineate a Maine specific

7   Dirigo Health Act effect. This is one specific problem with the srHS CMAD regression

8   methodology that I will address in greater detail later in this testimony.

9   Q.   Can you please explain how the srHS CMAD regression analysis works?

10   A.   Yes. **Chamber 2** provides a helpful summary of the four steps utilized in the regression

11   analysis. With respect to the US - Hospital Level regression analysis summarized on Table 1,

12   Column IV at page 54 of the srHS Report, the following four steps were undertaken.

13   Step 1: Produce regression coefficients using the data file "Data_US_Hosp.xls."   Note

14   that "CMAD" is the dependant variable; independent variables are "M" (which indicates Maine),

15   "D" (which indicates Dirigo), Y (which indicates Year, where 2000 = 0 and … 2007 = 7),

16   "Total.Beds," "Interns.Beds" (also referred to as residents per bed), "Rural.Indicator,"

17   "..Days.Medicare," "..Uninsured," "Wage.Index," "M:D," "M:Y," "Y:D," and "M:Y:D."

18   Step 2: Calculate the estimated CMAD value in the Dirigo time period by multiplying

19   the regression coefficients by the observed values for 2007, where the Dirigo time period value is

20   set to 1. I believe that srHS calculated the CMAD value in file "CMAD_Fitted Values."

21   Describe Step 3: Calculate the estimated CMAD value without the Dirigo time period by

22   multiplying the regression coefficients by the observed values for 2007, where the Dirigo time

1 period value is set to 0. I believe that srHS calculated the CMAD value in file "CMAD_Fitted

2 Values."

3   Describe Step 4: Subtract the estimated CMAD value with the Dirigo time period from

4 the estimated CMAD value without the Dirigo time period to calculate the "savings." I believe

5 that srHS calculated this difference in "dha_worksheet_02."

6 Q. Were these same four steps used for the Cluster 1 regression analysis?

7 A. Yes, but it should be noted that srHS used different data sets for the Cluster regressions,

8 srHS used different variables for the Cluster regressions, and srHS did not weight the cluster

9 regressions by discharges, as they did for the US hospital level regression.

10 Q. Are you certain that you were able to replicate the results of the srHS CMAD regression

11 methodology?

12 A. Yes. In the course of our work on this project, we duplicated the analyses performed by

13 srHS on its data for the national hospital regression. For the hospital level analyses, Table 5,

14 which appears later in my testimony, demonstrates that our analyses of data file "Data_US

15 Hosp.xls" matched the results of the analyses performed by srHS.

16 Q. Can you please provide a summary of your specific findings with respect to your review

17 of the srHS CMAD regression analysis?

18 A. Yes. We found several significant problems with the design of the srHS CMAD

19 regression analysis. First, the CMAD regression methodology is flawed because (a) it does not

20 control for several important variables that drive hospital cost growth; and (b) the data set used in

21 the CMAD regression is flawed.

22   Second, the Interpretation of CMAD regression methodology is flawed because (a) only

23 select coefficients that are important to understanding the impact of Dirigo on Maine should be

1   used in the estimate of the Dirigo Health Act savings effect; and (b) these coefficients are not

2   statistically significant.

3   Third, the promotion of the Cluster CMAD results by srHS is overly aggressive because

4   R-squared measures in this case are inflated for technical reasons.

5   Fourth, and most importantly, an alternate interpretation of the srHS CMAD data suggest

6   zero Dirigo savings.

7   Finally, the CMAD variable itself is critically flawed from a savings perspective.

8   **srHS's Model is Flawed**

9   Q.   Let's start with your first finding, that the CMAD regression methodology is flawed. Can

10   you provide a more specific explanation?

11   A.   Yes. I believe that the srHS CMAD regression model is flawed because, first of all, it

12   does not control for several important variables that drive hospital cost growth and, secondly, the

13   data set used in the CMAD regression is flawed.

14   Q.   Please expand on your first point.

15   A.   Ideally, an analysis of Maine's Dirigo Health Act would examine numerous variables to

16   assess the impact of the legislation on costs. These variables include, but are not limited to, the

17   following:

18   1.   The regulatory environment (including certificate of need and rate setting);

19   2.   HMO penetration as a measure of insurance competition;

20   3.   Hospital competition (e.g., Herfindahl index);

21   4.   Hospital ownership status (e.g., non-profit and for-profit);

22   5.   Teaching status;

23   6.   Occupancy rates;

| | 7. | Staffing intensity; |
| 1 | | |

| 2 | 8. | Wage indices; |

| 3 | 9. | System affiliation; |

| 4 | 10. | Proportion of Medicaid patients; |

| 5 | 11. | Proportion of Medicare patients; |

| 6 | 12. | Acuity (e.g., case-mix); |

| 7 | 13. | Income levels; and |

| 8 | 14. | Other socio-economic variables (such as employment levels, race, age, and |

9   education).

10   In the documentation provided by the DHA, srHS demonstrates that it considered some

11   of these variables in the three CMAD regression analyses it discusses in its June 2, 2008 report.

12   Q.   In your opinion, what is missing?

13   A.   The srHS CMAD regression model does not control for several important variables,

14   including (1) hospital competition; (2) insurance competition; (3) supply of physicians; (4)

15   certificate of need and other types of regulations; (5) hospital owner status; 6) employment. The

16   extensive literature on the impact of the certificate of need legislation on hospital cost used these

17   types of variables. However, srHS does not explain why it neglected to incorporate these well-

18   known and readily available variables.

19   I agree with Anthem witness Mr. Maffei that the failure to include economic or hospital

20   financial variables contributes to an unreliable model. I also agree with MEAHP Witnesses Mr.

21   Burke and Dr. Fishbein that the model's failure to take into account reimbursement levels, such

22   as MaineCare cut, would make the model's results unreliable.

23   Q.   Why is the omission of key variables important?

1 A.   If the correct variables are not entered into the regression model, the coefficients of the

2 Dirigo variable may be incorrectly estimated. This is because the Dirigo coefficients may reflect

3 the impact of important omitted variables for instance, if employment growth leads to hospital

4 growth, CMAD could fall (economies of scale, less sick patients within DRGs). If employment

5 rose during the Dirigo time frame the regression would attribute CMAD reductions to Dirigo as

6 opposed to employment.

7 Q.   Have you been able to quantify the impact of these omitted variables?

8 A.   No. The timeline provided by this hearing is not sufficient to add these variables,

9 although srHS certainly had the time to do this. Because srHS excluded, without any

10 explanation, these well-established variables that affect hospital costs were excluded from the

11 analysis, I would suggest that their recommended "savings" figures are suspect. This is

12 especially appropriate because of the fact that the key variables that drive the srHS "savings"

13 projection are not statistically significant, as I will explain later in my testimony.

14 Q.   Are there other flaws in the srHS model?

15 A.   Yes, srHS was not consistent in the use of variables among its regressions. Of primary

16 concern is the fact that they used different variables for each regression and that some of the

17 variables commonly found in health cost regressions are not present in any of their analyses.

18 Additionally, the U.S. hospital-level regression model was based on hospital level data, and the

19 Cluster analyses used State level aggregate data. Although the State level data tended to push up

20 the R-squared, it did not bring any savings coefficients into analytical significance at over the

21 90% confidence level.

22 Q.   Do you have other concerns?

1   A.   Yes, srHS employs "credibility weights" of 75% and 25% to synthesize their regression

2   results. This weighting appears to be arbitrary. Neither of the two models' key variables related

3   to Dirigo Health Act's impact in Maine reach statistical significance, and srHS arbitrarily picked

4   a weighting method.

5   Q.   Did you identify any other problems?

6   A.   While the application of regression analyses for health care services research is widely

7   accepted, cost data require careful consideration because cost data are not normally distributed

8   and OLS regression methodology assumptions depend upon normality in data used. For

9   instance:

10   "In general, OLS (ordinary least squares) models are not appropriate for cost data.

11   Residuals are likely to be non-normal and not to have constant variance,

12   relationships may not be truly linear and models could predict impossible

13   negative numbers."

14   *(Julie Barber, Simon Thompson, Multiple Regression of Cost Data: Use of*

15   *Generalized Linear Model, Journal of Health Service Research and Policy,*

16   *October 2004, vol. 9, no. 4, 197).)* **Chamber 11**

17 And again,

18   "All phenomena do not necessarily conform to a straight line function. Health

19   care utilization or cost data are rarely normally distributed and are often

20   characterized by heteroscedasity (different scattering) and distributions that are

21   positively skewed, thus warranting transformation to reach the assumption of

22   normality. Departures from linearity may be investigated via regression,

23   providing that the proper mathematical operands are expressed within the model.

1		Various transformations of variables, may also be employed to create linear
2		functions in instances that involve curvilinear on non-linear processes, skewed
3		distributions, or heteroscedastic residuals; transformations may additionally
4		resolve violations of the OLS (ordinary least squares) estimation of a regression
5		model and can essentially change a nonlinear form to a linear one. To illustrate, if
6		an observed relationship exists between the variables, a logarithmic
7		transformation (often with a Naperian or natural logarithm, ln) may establish a
8		linear function between the variables."
9		*(Grant H. Skrepnek, Ph.D., Regression Methods in the Empirical Analysis of*
10		*Health Care, Journal of Managed Care Pharmacy, April 2005, vo. 5, no. 3, 241)*
11		**Chamber 11**
12	Q.	What should srHS have done differently to avoid this issue?
13	A.	At a minimum, srHS should have "logged" the CMAD variable, if not many of their

14   explanatory variables, to determine if their savings estimates are influenced by non-normalty in

15   CMAD data distributions. The Centers for Medicare and Medicaid Services (CMS), for

16   instance, nearly always logs their cost variable in their regulatory analyses.

17   Generally, it is advisable to employ numerous methods in studies such as this one. As I

18   have explained elsewhere in my testimony, a careful analysis of descriptive data is critically

19   important to understanding the CMAD regression results. For example, srHS could have

20   supplemented its regression calculations with key-informant interviews, such as hospital finance

21   personnel. Ideally regression results would be validated with consistent results from other

22   approaches. It does not appear that srHS performed such approaches.

23   Q.   In the Superintendent's decision for Year 3 at p. 9, the Superintendent noted several flaws

1   in the srHS methodology, as follows: "The tenuous connection cited in the Superintendent's

2   Year Two Decision between historic and current cost per CMAD is a basic characteristic of the

3   methodology. That connection becomes more tenuous each year due to the combination of the

4   passage of time and the CMAD methodology's lack of control for factors unrelated to Dirigo.

5   Time both diminishes the relevance of the available pre-Dirigo historical data and assigns an

6   increasingly disproportionate dollar value to small variations in the trend rate chosen to project

7   forward from 2003." In addition, the Superintendent criticized srHS failure to control for the

8   effect of cost based reimbursement, the recoverability of savings, effect of outpatient charges,

9   and MaineCare reimbursement cuts. Did the srHS regression methodology effectively control

10 for these items?

11 A.   As I will explain later in my testimony, the pre-Dirigo (2000 to 2003) and post-Dirigo

12 (2004-2007) time trend remains a significant force in the srHS regression analysis. The other

13 variables identified by the Superintendent are not included among the co-variates identified in

14 the regression analysis.

15   **srHS Data Set is Flawed**

16 Q.   You stated before that the data set used in the CMAD regression is flawed. Can you

17 please expand on this point?

18 A.   We understand that srHS used data file "Data_US Hos.xls" for its hospital-level

19 regression analysis. Our review of this file has identified much anomalous data which suggests

20 data cleaning efforts were less-than-effective. As a result, we question the reliability of both the

21 remaining analyses and interpretation. In other words, "Garbage in, Garbage Out." A summary

22 of our findings in included on **Chamber 6.**

23 Q.   Can you offer a few examples?

1   A.   Yes. The examples would include:

2   •   An implausible range of CMAD values from a low of 0.41513060 to
3   19,982.66541, and the hospitals at the higher end do not appear to be teaching
4   hospitals;
5
6   •   There were 740 observations of hospitals with the same CMAD value when
7   expressed out to the 11th decimal (e.g. 7 hospitals had the exact value of
8   5403.28606406227). Given the number of variable that are contained in the
9   CMAD formula used by srHS, it is highly unlikely that exact duplication is
10   plausible;
11
12   •   The were 21 observations of hospital beds exceeding the largest number of beds
13   (1660 according to CMS data), including a bed size of 44491.82665 and
14   16299.17355;
15
16   •   % Days Medicare included hospitals with percentages of 106.1728% and
17   4744.8276%.
18
19 Q.   What is your opinion regarding the raw data underlying all of srHS CMAD regression

20 analyses?

21 A.   The anomalous values (e.g., 4744 percent Medicare Days) suggest that raw data

22 adjustments were less-than-thorough. Additionally, duplicate CMAD calculated values suggest

23 that there are numerous errors in the dataset or that all data cleaning / normalization processes

24 were not documented by srHS. Another possibility is that the srHS database is somehow

25 corrupted as the anomalies we have identified would not seem to be intentional.

26 Q.   Have you reviewed the Maine statewide hospital level CMAD utilized by srHS in the

27 proceedings for the Second and Third Assessment Years?

28 A.   Yes. Although the underlying data for each of the proceedings was purported to be

29 excerpts from Medicare cost reports, the figures are different for each year as illustrated on

30 **Chamber 7**. Of course, some minor variation would be expected as the data is updated with

31 audited Medicare cost reports one year to the next. For example, the statewide aggregate CMAD

32 figures changed slightly from Year 2 to Year 3. However, there appear to be material differences

1   between the CMAD figures used in Year 3 and Year 4, and these differences produce

2   significantly different pre-Dirigo (2000-2003) rates of growth rates. Based upon the

3   documentation provided, it is not possible to tell whether these differences are due to the

4   Medicare audit process or the data problems outlined above. Interestingly, there is no

5   explanation for these material differences in the srHS Report or the DHA's pre-filed testimony.

6   **srHS's Interpretation is Flawed**

7   Q.   You have opined that srHS's interpretation of the CMAD regression methodology is

8   flawed. Can you explain this in greater detail?

9   A.   Yes. There are two problems with srHS's interpretation of the regression methodology.

10   First, only those coefficients that are important to understanding the impact of the Dirigo Health

11   Act on Maine should be used in the estimate of the Dirigo Health Act savings effect. Second, the

12   coefficients driving the srHS recommended savings are not statistically significant.

13   Q.   Can you expand on your first point?

14   Table 4 below summarizes the US Hospital level per CMAD "savings" figure per the

15   srHS CMAD regression model by showing only those coefficients which account for the alleged

16   savings under the srHS model. **Chamber 2.** Please note that the Dirigo coefficient is actually in

17   the wrong direction for "savings." Together, the four regression components produce an alleged

18   Dirigo Health Act savings effect under the srHS model of 439.0511, which ties to the $439

19   estimate set forth on page 54 of the srHS Report. As demonstrated below, the interaction

20   between the Year ("Y") and Dirigo ("D") coefficient shows the largest "savings effect," despite

21   the fact that this is not a Maine-specific variable.

22   In addition, Table 4 shows the impact of reducing the year multiplier from 7 to 4.

23   Imbedded in the srHS analysis is a year multiplier of 7. This implies that the Dirigo saving have

1   7 years to accumulate. As we note elsewhere, the descriptive statistics are not compatible with

2   this assumption. From a purely technical perspective, however, since Dirigo has only been in

3   existence for 4 years an annual multiplier of 4 is the most that could be assumed. This change in

4   and of itself reduces the srHS Dirigo CMAD savings estimate from $439 to $157. If only the

5   two key saving estimate variables are viewed, the comparable impact would be to reduce savings

6   from $291 to $194.

7

Table 4: Regression Savings Components

"Savings" Regression Variables	srHS	Dobson|DaVanzo	srHS	Dobson|DaVanzo
	Multiplier Equal 7		**Multiplier Equal 7**	
	"Savings Effect"	**Removal of Dirigo and Year*Dirigo Time Trend**	**"Savings Effect"**	**Removal of Dirigo and Year*Dirigo Time Trend**
Dirigo ("D")	-285.6101		-285.6101	
M:D	65.4460	65.4460	65.4460	65.4460
Y:D	433.6850		247.8200	
M:Y:D	225.5302	225.5302	128.8744	128.8744
	Estimates		**Estimates**	
CMADs	439.05	290.98	156.53	194.32

8
9   Q.   Why do you say that the Y:D interaction is not a Maine-specific variable?

10   A.   As I explained earlier in my testimony, although srHS implies that the "Dirigo" variable

11   is a Maine specific effect that produces Maine specific "savings," as used in the srHS regression

12   analysis, the Dirigo variable is simply a pre-Dirigo (2000-2003) and post-Dirigo (2004-2007)

13   time trend that applies to all hospitals in the country. Therefore, the Dirigo variable is essentially

14   a variant of a time trend analysis, not a program effect analysis. The Year variable ("Y") is also

15   not Maine-specific.   The use of an interaction of these two variables attribute national pre-Dirigo

16   (2000-2003) / post-Dirigo (2004-2007) time trend effect to Maine. This is not appropriate.

17   Because the srHS interpretation includes variables that are not specific to Maine, their

18   interpretation is flawed.

1   Q.   What does this means?

2   A.   It is my opinion that the $433.685 of "savings effect" attributable to the Y:D interaction

3   represents a national time trend effect, and should not be included in a estimate of "savings"

4   attributable to the Dirigo Health Act. In fact, as noted above, this value is calculated by

5   multiplying 7 (the value for 2007) times the Y:D coeffieicnt of 61.9550 which equals 433.685.

6   This has the effect of compounding the recommended "savings" by a yearly growth factor

7   multiplied by 7. This is inappropriate because even in the post-Dirigo period, the Table 1, 2 and

8   3 descriptive statistics indicate that Maine's growth rates in the post-Dirigo period (2004-2007)

9   have outpaced the national trend, although Maine's growth rate for 2002/2003 (the year prior to

10 Dirigo) was below the national trend. This would indicate that there is no savings, and therefore

11 compounding is particularly inappropriate. At best, as shown in Table 4 above, an annual

12 compounding across the 4 years Dirigo has been in existence could be considered.

13 Q.   So it is your opinion that the $433.685 should not be included in the "savings effect."

14 Does this mean that the remaining amount is properly included in the estimate of "savings"

15 attributable to the Dirigo Health Act?

16 A.   No. My second point with respect to srHS's flawed interpretation of the CMAD

17 regression results is that the coefficients driving the alleged "savings effect" are not statistically

18 significant.

19 Q.   Can you explain what you mean by that?

20 A.   Yes. Table 5 below represents our replication of the srHS regression output for the Total

21 US Hospital analysis.

22

23

Table 5: Regression Output for Total US Hospital Analysis

	srHS	Dobson | DaVanzo				
		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
(Intercept)	847.9188	847.9188	105.2954		8.0528	0.0000
Maine*	*432.6228*	*432.6228*	*312.0161*	*0.0125*	*1.3865*	*0.1656*
Dirigo	285.6101	285.6101	65.0775	0.0624	4.3888	0.0000
Year	268.5658	268.5658	11.3216	0.2681	23.7216	0.0000
Total.Beds	0.8724	0.8724	0.0315	0.1186	27.7298	0.0000
Interns.Beds	4528.4547	4528.4547	50.8485	0.4067	89.0578	0.0000
Rural.Indicator	-475.1056	-475.1056	25.7348	-0.0778	-18.4616	0.0000
..Days.Medicare	-1332.4051	-1332.4051	67.5437	-0.0916	-19.7266	0.0000
..Uninsured	32.4890	32.4890	2.2261	0.0606	14.5943	0.0000
Wage.Index	4364.3824	4364.3824	88.5942	0.1988	49.2626	0.0000
M:D*	*-65.4460*	*-65.4460*	*990.3913*	*-0.0013*	*-0.0661*	*0.9473*
M:Y*	*130.7365*	*130.7365*	*167.0321*	*0.0158*	*0.7827*	*0.4338*
Y:D	-61.9550	-61.9550	15.7172	-0.0776	-3.9419	0.0001
M:Y:D*	*-32.2186*	*-32.2186*	*236.4283*	*-0.0037*	*-0.1363*	*0.8916*

2   * = Maine specific variable

3   Q.   What does this table tell you from an econometric perspective?

4   A.   One thing which is quite evident from this analysis is that there are serious problems with

5   statistical significance.

6   Q.   Can you please explain what you mean by statistical significance?

7   A.   Regression coefficients are estimates and are subject to statistical variability. When

8   coefficient t values are above 1.96 (approximately) this indicates that only 1 out of 20 times

9   would the value of the coefficient occur by chance. This is also called a 95% confidence level

10   and is the standard of peer reviewed journals (some authors only report .01 levels of significant,

11   i.e., only 1 out of 100 chances of being randomly drawn or a 99% confidence level).

12   Q.   Why is this important?

13   A.   If the variables related to the savings findings are not statistically significant, the finding

14   could be due to random chance, and hence not related to the Dirigo Health Act.

1   Q.   What are the variables related to the srHS savings findings?

2   A.   As explained in Table 4 above, the variables that produce the recommended "savings" of

3    $439 are D (which works against "savings"), M:D, Y:D, and M:Y:D. Although Y:D is

4   statistically significant, as explained above, it is not a Maine-specific variable, but instead a time

5   trend that applies to all hospitals in the country. The other variables that are responsible for the

6   srHS recommended "savings" amount (M:D and M:Y:D) are not statistically significant, and

7   cannot reasonably support a finding of savings related to the Dirigo Health Act.

8   Q.   Can this be demonstrated another way?

9   A.   Yes. A simple test of this is the calculating the overall regression R-squared with and

10   without the key Dirigo Maine interaction terms.

11   Q.   What is the R-squared?

12   A.   As Mr. Schramm explained in his testimony, The R-squared statistic "measures the

13   proportion of variability in the dependent variable (CMAD) that is explained by the fitted

14   regression model."

15   Q.   What happened when you calculated the overall regression R-squared with and without

16   the key Dirigo Maine interaction terms.

17   A.   Table 6 below shows the overall regression R-squared with the key Dirigo:Year

18   interaction terms and without. We also ran the model with all of the interaction terms removed.

19   You will note that the overall regression R-squared remained identical out to 3 decimal places.

20

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Table 6: R-Squared Test

	srHS Dirigo Model		Remove Dirigo and Dirigo:Year Interaction		Remove All Interactions	
R Square	0.428		0.428		0.428	
	Coefficients	Sig.	Coefficients	Sig.	Coefficients	Sig.
	B		B		B	
(Constant)	847.9188	0.0000	870.3506	0.0000	877.6389	0.0000
M	432.6228	0.1656	395.3999	0.2047	768.7262	0.0000
D	285.6101	0.0000	n/a	n/a	70.6580	0.0483
Y	268.5658	0.0000	250.2620	0.0000	237.1059	0.0000
Total Beds	0.8724	0.0000	0.8720	0.0000	0.8718	0.0000
Interns/Beds	4528.4547	0.0000	4533.9015	0.0000	4534.2707	0.0000
Rural/Urban Indicator	-475.1056	0.0000	-476.8294	0.0000	-476.1739	0.0000
% Days Medicare	-1332.4051	0.0000	-1316.3832	0.0000	-1317.1624	0.0000
% Uninsured	32.4890	0.0000	32.7768	0.0000	32.8901	0.0000
Wage Index	4364.3824	0.0000	4367.8549	0.0000	4370.0533	0.0000
MD	-65.4460	0.9473	220.0144	0.8239	n/a	n/a
MY	130.7365	0.4338	149.1367	0.3711	n/a	n/a
DY	-61.9550	0.0001	n/a	n/a	n/a	n/a
MDY	-32.2186	0.8916	-94.1138	0.6900	n/a	n/a

2

3   Q.   Why is it important that the R-squared did not change?

4   **A.**   Although srHS states that its CMAD regression model overall R-squared suggest "good

5   predictive value," the model's R-squares are <u>not</u> influenced by their selection of savings

6   variables. The R-squared are entirely driven by the covariates: Dirigo, year, total beds, interns

7   per bed, rural/urban indicator, % Medicare days, % unisired, Wage Index. The variable Maine

8   has almost no impact on the R squared value.

9   Q.   What does that mean?

10   A.   It means that the key Dirigo Maine interaction terms (which drive the savings estimate)

11   do not explain any of the variation in CMAD after the model is controlled for the srHS

12   explanatory variables (i.e. total bed, critical access, % days Medicaid, % days Medicare, wage

13   index, Dirigo). In other words, all of the Maine and Maine / Dirigo related variables have no

1   statistical significance, and therefore, there is no statistically significant Dirigo Health Act

2   impact for Maine.   Thus any savings estimates from the srHS model are at best questionable.

3   Q.   What else does the Table 5 (Regression Output for Total US Hospital Analysis) show?

4   A.   Interestingly, there is a national Dirigo effect (Dirigo is significant in Y:D). This means

5   the times before Dirigo (2000-2003) and the times after Dirigo (2004-2007) have a different

6   CMAD trend for all hospitals in the nation relative to the overall national time trend. Thus the

7   overall time trend for the nation (Y) is significant, but not the Maine specific Dirigo time trend

8   (M:D). This is consistent with my testimony above that the Y:D interaction represents a national

9   time trend effect, and should not be included in a estimate of "savings" attributable to the Dirigo

10   Health Act.

11   Q.   How else have you been able to demonstrate this important fact?

12   A.   To corroborate this finding, we replicated the srHS CMAD regression analysis for all

13   states other than Maine, using the srHS data and methodology. **Chamber 5.** We replaced the

14   Maine-specific "dummy" variable and "dummy" variable for each particular state under this

15   analysis. As set forth on Table 7 below, the results of this analysis shows an apparent random

16   distribution pattern around pre/post-Dirigo rates of growth.
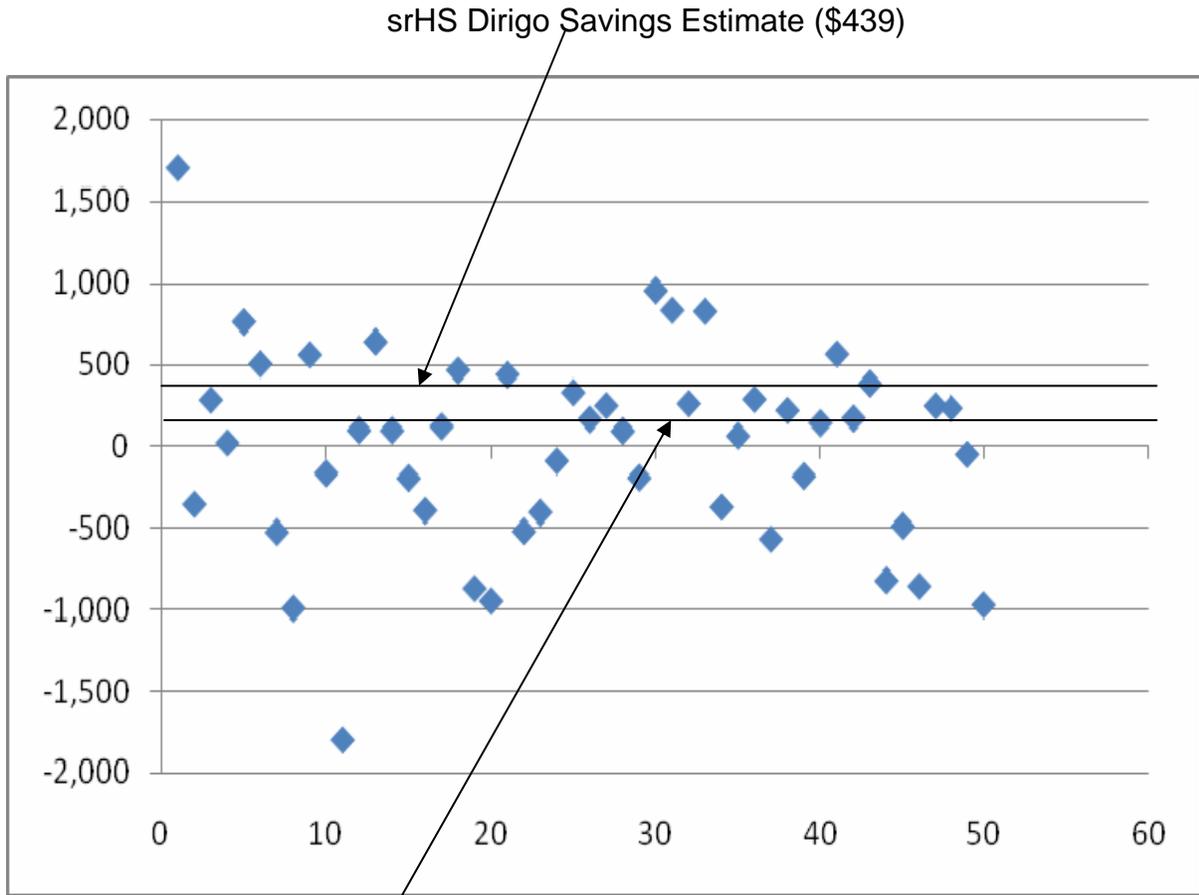
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1 **Table 7: All Other States Regression Analysis:**

2 srHS Dirigo Savings Estimate ($439)

3

4

5 Average of the Dirigo "Savings" Effect on All Non-Maine States ($110)

6 Q.   What does Table 7 illustrate?

7 A.   We found that 29 of 50 states showed a Dirigo variable (time period) savings effect, and

8 15 states had a "Dirigo effect" or "savings" that was similar or greater than Maine's. We found

9 that, for example, California has a Dirigo variable (time period) savings effect of $762 per

10 discharge compared to the alleged Maine Dirigo variable (time period) effect of $439 per

11 discharge case. Similarly, Florida has a Dirigo effect of $561.

1   The 15 states which have a "Dirigo" effect which is close to Maines are: Arkansas, Colorado,

2   Florida, Idaho, Louisiana, Mississippi, Montana, North Carolina, New Mexico, Oklahoma,

3   Pennsylvania, South Dakota, Tennessee, Texas, Washington and Wisconsin.

4   Q.   What is the relevance of these findings?

5   A.   The Dirigo effect attributed to the other states cannot possibly be attributable to the

6   Dirigo Health Act because the Act does not apply in those states. This further demonstrates a

7   strong pre / post 2004 time trend totally unrelated to the enactment of the Dirigo Health Act in

8   Maine. This could on the face of it indicate that the srHS regression model is invalid.

9   Q.   Other than invalidating the srHS CMAD regression methodology itself, what other

10   interpretation could you provide?

11   A.   The sheer number of states that show "savings," including 15 states that showed savings

12   that exceeded Maine's, implies that there strong national forces pushing down CMAD growth in

13   the post-Dirigo time period (2004-2007). These results, using srHS's own data and regression

14   methodology, prove that the methodology does not take into account significant drivers of rates

15   of cost growth, but instead confuse these drivers with pre / post Dirigo time frame-related

16   "savings." Put another way, the srHS model is not measuring cost growth decline that is

17   attributable to the Dirigo Health Act, but as Anthem Witness Mr. Maffei correctly recognized,

18   instead simply measures "variations in the rate of cost growth across different states." He is

19   correct that "the srHS model measures declines after 2004 and assumes that if cost growth slows

20   more in the target state [Maine] than the benchmark, it is attributable to Dirigo." The fact that 29

21   States experienced a decline as measured against the benchmark (including 15 states with similar

22   or greater reductions) disproves the srHS assumption that the declines must be related to the

23   Dirigo Health Act.

1   Q.   Would it be proper to use an average of the other states' "savings" as a means of

2   quantifying the pre / post Dirigo time trend?

3   A.   We determined that the case weighted average Dirigo variable effect on CMAD across all

4   non Maine states was $110. If this is subtracted from the srHS Dirigo CMAD effect of $439, the

5   result is $329.

6   Q.   Are you suggesting that this $329 figure represents "savings" attributable to the Dirigo

7   Health Act voluntary CMAD limit?

8   A.   No. I am saying that the statistics show that $110 of the amount identified by the srHS

9   CMAD regression cannot be considered "savings" attributable to the Dirigo Health Act

10   voluntary CMAD limit based upon srHS's own data and methodology. The remaining portion

11   must still be supported by the data. Again, the key coefficients used to predict "savings" lack

12   statistical significance, meaning that the finding could be the result of random chance. The fact

13   that over half (29) of the states showed savings under the srHS CMAD regression analysis is

14   strong evidence that the srHS recommended CMAD "savings" in Maine could very well be the

15   result of random chance. Later on in my testimony, I will explain other reasons that the

16   recommended "savings" are unreasonable, such as technical defects with the Cluster 1 regression

17   and alternative analyses that similarly point to no significant savings.

18   Q.   Is there further evidence of a random effect?

19   A.   In **Chamber 4**, we found a similar random outcome when we replicated the analysis set

20   forth on p. 54 of the srHS Report, Table 1, Column III for all 50 states. We used the same data

21   and methodology as srHS. Using Maine's discharge figures for comparison purposes, we found

22   that 39 states had "savings" in that the actual CMAD was lower than the projected CMAD, and

23   20 states (including Maine) had "savings" of $150 million or more. This is additional evidence

1   of a general nationwide slowing of the rates of growth that is unrelated to the Dirigo Health Act.

2   It is also evidence that a historical compound average growth rate based upon the 2000 to 2003

3   time period does not have much predictive value in Maine or elsewhere.

4   Q.   You said that you used Maine's discharge figures for comparative purposes. Would the

5   amount of savings change if you had used the individual states' actual discharge figures.

6   A.   Yes. The difference between the projected CMAD and actual CMAD (whether "savings"

7   or "negative savings") would be multiplied by the state's discharge figure. Since Maine is a state

8   with relatively low population, the use of a State's actual discharge figures would generally

9   increase the "savings" under this method. For example, California has a similar per discharge

10   "savings" of $1,045. According to DHA Data Set 18, California had approximately 3,459,608

11   inpatient discharges for SFY 2007. So without even including outpatient discharge equivalents,

12   the "savings" attributable to California would have been over $3.6 billion.

13   Q.   What about the significance of the Cluster analyses?

14   A.   As set forth in Table 8 below, the Cluster analyses coefficients show comparable results,

15   except that not even the Dirigo coefficient is significant in Cluster 1. This means that the t-

16   statistic at value of 1.44 is less than the 1.96 value required for a 95% confidence level which is

17   considered a standard for econometrics. This suggests that Cluster 1 analysis is even <u>less</u>

18   meaningful than the U.S. Hospital level analyses.

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Table 8: Regression Output for Cluster Analysis

	srHS	Dobson | DaVanzo				
		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
(Constant)	4238.5864	4238.5864	1137.1805		3.7273	0.0007
Maine	2045.5356	2045.5356	408.5745	0.8724	5.0065	0.0000
Dirigo*	317.0393	317.0393	219.7658	0.1814	1.4426	0.1580
Year	316.1252	316.1252	38.6969	0.8290	8.1693	0.0000
Total Beds	0.1095	0.1095	0.0120	0.7950	9.1427	0.0000
Critical Access Indicator	6947.5434	6947.5434	2062.7086	0.2306	3.3682	0.0019
% Days Medicaid	-3595.6228	-3595.6228	1183.4580	-0.1969	-3.0382	0.0045
% Days Medicare	-6610.7873	-6610.7873	1428.1671	-0.6454	-4.6289	0.0000
Wage Index	2895.4998	2895.4998	848.1345	0.1865	3.4140	0.0016
MD*	657.6597	657.6597	476.6549	0.2080	1.3797	0.1764
MY*	62.5229	62.5229	80.9239	0.1149	0.7726	0.4449
DY*	-76.3457	-76.3457	55.4032	-0.2500	-1.3780	0.1769
MDY*	-185.4412	-185.4412	112.9817	-0.3298	-1.6413	0.1097

2

3 **Promotion of Cluster 1 CMAD Results is Overly Aggressive**

4 Q.   You testified earlier that the promotion of the Cluster CMAD results by srHS is overly

5 aggressive because R-squared measures in this case are inflated for technical reasons. Can you

6 explain what you mean by this?

7 A.   Yes, as explained above, the R-squared measures are not conclusive.

8 Q.   But doesn't srHS suggest that the Cluster 1 regression has a high R-squared measure?

9 A.   Yes, but the fact that srHS regressions have high R squared is essentially irrelevant as the

10 only coefficients that drive their savings estimates are statistically insignificant. Furthermore,

11 the Cluster 1 regression shows high R-squared because there are so few observations. That is,

12 there are eight years and seven states for a total of 56 observations. There are also 12

13 independent variables. Regression equations should have a least 10 to 15 observations per

14 variable in this case 120 to180 observations. Therefore, lack of "degrees of freedom" produces

1   inflated R squared.

2   Q.   Can you explain what you mean by "degrees of freedom?"

3   A.   Yes. A common way to think of degrees of freedom is as the number of independent

4   pieces of information available to estimate another piece of information. More concretely, the

5   number of degrees of freedom is the number of independent observations in a sample of data that

6   are available to estimate a parameter of the population from which that sample is drawn.

7   I would note that even with the high R-squared reported, srHS admits that the srHS

8   findings are little better then a flip of the coin as to if Dirigo savings are "real" or "not real." My

9   analysis presented below tips this interpretation towards the "not real" end of the spectrum.

10   **Alternate Interpretations of the Data Suggest Zero Savings**

11   Q.   You stated earlier that an alternate interpretation of the srHS CMAD data suggest zero

12   Dirigo savings. Can you expand on this point?

13   A.   Yes. As a reasonableness check, I incorporated the srHS data and regressions into an

14   "efficiency model."

15   Q.   Can you explain what you mean by an "efficiency model?"

16   A.   We ran the srHS regression for each year 2000 to 2007 using their covariates (e.g. Maine

17   (M), Dirigo (D), Year (Y), Total Beds, Interns/Beds, Critical Access Indicator, Rural Indicator,

18   % Days Medicaid, % Days Medicare, % FPL <100, % Uninsured, Wage Index, M*D, M*Y,

19   D*Y, and M*D*Y) and a Maine dummy variable (with the Maine=1; other states=0). This

20   analysis is similar to the descriptive statistics contained in Table 3, except that it employs the

21   srHS econometrics model. In light of the significant savings recommended by srHS, we

22   compared Maine's efficiency, that is, the CMAD for Maine as compares to the CMAD for other

23   states adjusted for the same covariates. The result is shown in Table 9, with supporting

1   documentation found at **Chamber 8.** As you can see, Maine was more efficient in 2000 and

2   2001 than in latter years. To be efficient, Maine's CMAD should be less than expected or the

3   efficiency ratio should be less than 1.0. By 2002, Maine was relatively inefficient at 109.9% in

4   2002 and stayed that way until 2007 with an efficiency ratio of 109.9%. This would suggest zero

5   savings to slightly higher costs for Dirigo. That is, if Maine hospitals are no more efficient (and

6   arguably less efficient) under Dirigo, how could they be saving money?

7   **Table 9: Efficiency Model**
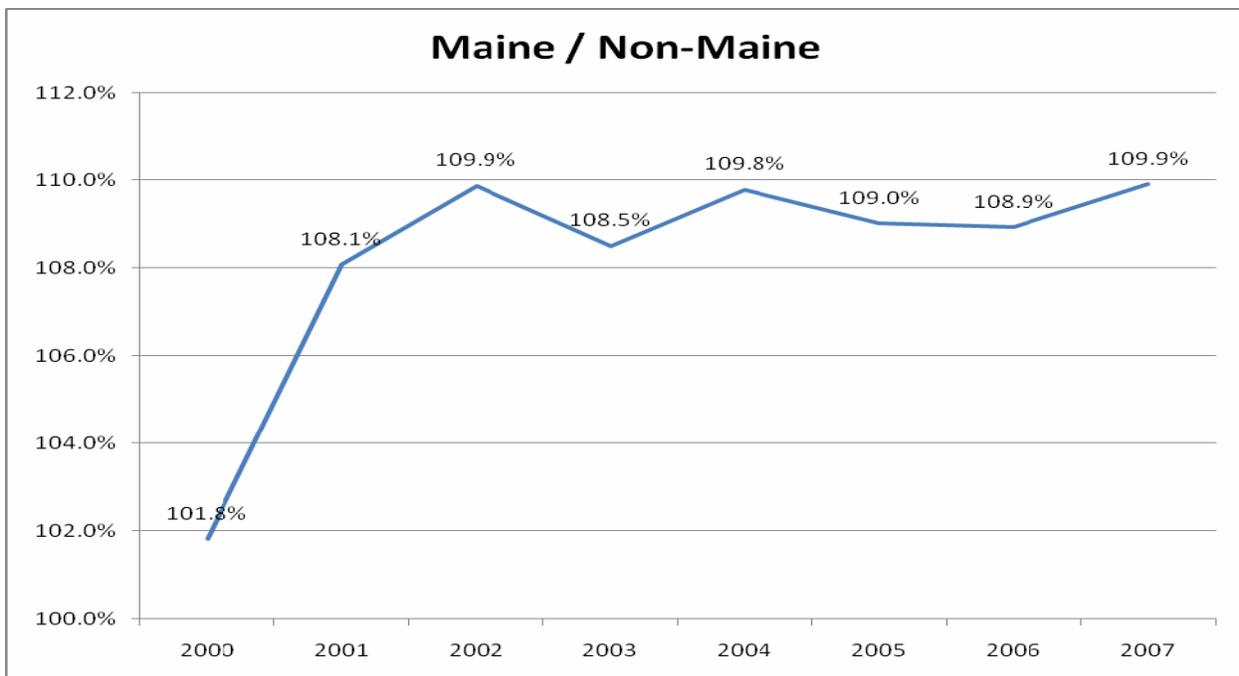
8

9   Q.   Are you saying that Maine hospitals are inefficient?

10 A.   No. We ran the efficiency model as a reasonableness test of the srHS CMAD regression

11 model and source data. One would expect a model that shows such dramatic savings would

12 likewise show increased efficiency. In this case, the opposite was true. This test shows that

13 Maine has not controlled costs as well as other states. This finding, in addition to the findings

14 addressed above, tends to prove that the srHS CMAD regression model itself is unreasonable.

1   Another explanation would be that the underlying data was incorrect, that important variables

2   were omitted, or that srHS has misinterpreted the econometrics.

3   Q.   Did you perform any other reasonableness tests?

4   A.   Yes. We examined the total consolidated operating margins (COM) for Maine hospitals

5   during the historic period. **Chamber 9**.

6   Q.   Why is operating margin important?

7   A.   It represents the excess (if any) of operating revenue less operating expense. As such, it

8   provides simple common sense test of whether or not the recommended savings is reasonable.

9   The recommended CMAD savings is $147.9 million, and total AMCS for Year 4 of

10   approximately $190 million. As detailed on Table 10, the total consolidated operating margin

11   for all Maine hospitals for HFY ending in 2001 through 2006(the latest data available to us), was

12   approximately $280 million. This would suggest that year 4 CMAD savings were over 50% of 6

13   years worth of COM surplus. Comparably, the CMAD savings are over one and one half times

14   the most recent COM.

15   **Table 10: COM**

Year	COM	Percent	Source
2001	$ 30,298,000	1.44%	DHA Yr. 1
2002	$ 2,011,000	.009%	DHA Yr. 1
2003	$ 13,729,000	0.53%	DHA Yr. 1
2004	$ 52,291,000	1.84%	DHA Yr. 1
2005	$ 92,369,164	2.90%	MHA
2006	$ 89,562,692	2.60%	MHA

16   Source: DHA Yr. 1 Calculation by Dr. Kane (2001-2004) and MHA Data. Individual hospital data
17   grouped by calendar year in which hospital fiscal year ended. **Chamber 9**
18
19

1 Q.   What does this data indicate?

2 A.   In light of the historical COM figures, a "savings" figure of $147.9 appears unreasonable.

3   **The CMAD Variable Itself is Critically Flawed from a Savings Perspective**

4 Q.   You testified earlier that the CMAD variable itself is critically flawed from a savings

5 perspective. Can you explain?

6 A.   The savings variable used by srHS is essentially a cost per unit of hospital services.

7 While the cost of providing a unit of service, or in this case a case mix and outpatient adjusted

8 discharge (CMAD), may be relevant to the issue of pricing, it is only one aspect. Other aspects

9 include payer mix (Medicare, Medicaid, commercial payors, uninsured), BD/CC levels,

10 reimbursement levels and operating margin, among others. A high concentration of Medicare

11 and Medicaid patients, high levels of BD/CC, and reimbursement cuts may require cost shifting,

12 the practice of increasing charges to those who can pay more to make up for the shortfalls caused

13 by others.

14 Q.   What is the importance of price?

15 A.   Analysts in the health care industry tend to focus on total expenditures, which is the

16 product of price times quantity. For example, even assuming that cost per CMAD is a

17 reasonable substitute for price, an insurer does not save money if it pays a lower unit value yet

18 purchase more units. In other words, even if price falls, volume may rise leading to higher

19 overall expenditures. That is why to the CBO baseline expenditure estimate for providers always

20 takes into account both price and volume. In my opinion, it is necessary to take into account

21 total expenditures to meaningfully analyze a savings impact from the perspective of commercial

22 providers.

23 Q.   But doesn't the CMAD calculation inherently take into account volume?

1   A.   Volume is one of the variables taken into account when determining cost per CMAD.

2   However, in CMAD savings calculation, savings per CMAD are multiplied time the number of

3   discharges. This means that as the volume increase, CMAD savings increases. But from the

4   payer perspective, volume increases means higher expenditures. This inconsistency is a fatal

5   flaw of the CMAD analysis.

6   Although cost per CMAD may be a useful tool for measuring year to year price

7   experience, it is simply not a useful tool for measuring savings to the health care system.

8   **CMAD Summary:**

9   Q.   Could you kindly summarize your findings regarding the recommended savings?

10   A.   The recommended savings should be disregarded for a number of reasons. First, the

11   srHS regression model itself is misleading because it fails to control for several important factors

12   that would be relevant to a finding of savings. Additionally, the data set used to perform the

13   regression analysis appears to be unreliable because it contains numerous observations whose

14   values simply cannot be true.

15   Second, the srHS regression analysis attempts to capitalize on coefficients or interactions

16   that have the effect of compounding alleged "savings," and sneaks in, rather than parses out,

17   non-Dirigo related phenomena such as the national trend. For example, these same coefficients

18   or interactions produce similar or greater savings in other states -- states that do not have the

19   Dirigo Health Act. Moreover, srHS has misinterpreted the regression analysis by disregarding

20   the descriptive statistics and relying upon the regression coefficients that are simply not

21   statistically significant from an econometric perspective.

1   Third, although srHS suggests that the Cluster analysis has strong explanatory power

2   based upon an R-squared of 98%; however, the R-squared measure is inflated for technical

3   reasons. Furthermore, none of the key Dirigo-specific variables are statistically significant.

4   Fourth, common sense interpretations of the srHS CMAD data suggest zero Dirigo

5   Health Act related savings.

6   Finally, by ignoring the concept of total health expenditures, the cost per CMAD

7   variable itself is an inappropriate measure of savings.

8   **BD/CC:**

9   Q.   Please share any findings you have based upon your review of the BD/CC methodology.

10   A.   I have found several significant problems with the BD/CC methodology. First, although

11   I was not involved with the prior years' proceedings, I understand that the BD/CC model

12   produces approximately 6 times the amount of savings deemed reasonable last year. Although

13   Mr. Schramm suggests that this year's methodology is different and more comprehensive, his

14   explanation does not go to the reasonableness of the methodology. Instead, his explanation

15   illustrates a significant overlap of the BD/CC and CMAD methodologies. It is also clear that the

16   BD/CC model attempts to take credit for matters that are not related to the Dirigo Health Act or

17   the Dirigo Health Agency.

18   Q.   What is your next finding?

19   A.   The srHS BD/CC model uses a pre-Dirigo period time period (1999 to 2002) that is

20   inconsistent with the CMAD methodology, which used a 2000 to 2003 state fiscal year (June 30)

21   time period. Although Dr. Thorpe explained that he used 2003 as the first post-Dirigo year

22   because the uninsured data was on a calendar year basis and the Dirigo Health Act became

23   effective in 2003 (September 2003), this explanation is not satisfactory. I note that the srHS

1   CMAD methodology allegedly weighted the cost, charges and discharge data from thousands of

2   hospital fiscal year to fit Maine's fiscal year (June 30). It is unclear why Dr. Thorpe did not do

3   the same.

4   I have been advised that (a) the Dirigo Health Agency did not begin issuing Dirigo

5   Choice health insurance coverage until 2005; (b) the MaineCare expansion authorized by the

6   Dirigo Health Act did not begin coverage until 2005; and (c) the Maine Quality Forum did not

7   have its first substantive meeting until January 16, 2004. If this is true, then the use of 2003 in

8   the post-Dirigo time period is inappropriate as it gives Dirigo credit for a significant drop in the

9   rate of uninsurance which cannot be attributed to the Dirigo Health Act.

10   Q.   Are there other findings that you would like to share?

11   A.   In my opinion, the srHS data does not support their assumption that 30,000 to 55,000

12   Maine citizens were able to afford health insurance premiums as a result of Dirigo Health Act

13   reforms. As illustrated by the Table below, the reduction in the number of uninsured between

14   2004 and 2008 is approximately 16,933 (126,536 - 109,605). This is true even if one assumes

15   that the srHS projected percent uninsured for 2008 is calculated correctly, which I do not.

16   **Table 11: Summary of srHS BD/CC Data**
17

Year	Percent Uninsured	Maine Population	# of Uninsured	Increase (Decrease)	Change
1999	13.25%	1,103,652	146,220		
2000	12.40%	1,126,144	139,670	(6,549)	0.955208
2001	12.07%	1,081,270	130,501	(9,169)	0.934351
2002	13.04%	1,067,611	139,250	8,749	1.067039
2003	11.79%	1,073,084	126,538	(12,712)	0.908714
2004	11.64%	1,087,397	126,536	(2)	0.999981
2005	11.67%	1,114,873	130,133	3,598	1.028431
2006	10.67%	1,146,038	122,296	(7,837)	0.939774
2007	10.15%	1,131,955	114,881	(7,414)	0.939373
2008	9.65%	1,135,544	109,605	(5,276)	0.954075

                    Source: srHS Report, Appendix I, Table 1, p. 70
18
19   Q.   Why do you believe that srHS has incorrectly projected the percent uninsured for 2008.

1   A.   I believe the MEAHP witness Mr. Burke does an exemplary job of explaining the flaw in

2   the srHS projection. The decrease in the uninsured in Maine is explained by three events: (a)

3   the MaineCare non-categorical waiver (which I understand was adopted in 2002, took effect in

4   2003 and was not part of the Dirigo Health Act); (b) the Dirigo Choice enrollees who were

5   previously uninsured; and (c) the Dirigo Health Act MaineCare parent's expansion. Additional

6   enrollment in the MaineCare non-categorical waiver is limited by Maine's federal Medicaid

7   DSH cap, a limit that provides no significant room for additional enrollees. **DHA Exhibit 3,**

8   **dha document 44, p. 37.** Likewise, there has been no significant increased enrollment in the

9   Dirigo Health Act MaineCare parent's expansion from 2007 to 2008. Enrollment in Dirigo

10   Choice has actually declined since 2007. Therefore, srHS model over-estimates the expected

11   reduction in uninsurance rates.

12   Q.   Do you have any other concerns about the BD/CC methodology?

13   A.   First, the lack of transparency concerns me. Statistical programs were written that

14   included instructions to delete interim datasets that were key to the analyses, output needed to

15   evaluate results from the regression analysis was missing, and the process used to "un-log"

16   regression results was not detailed. I would also note that the application of regression

17   methodology is inconsistent with the srHS CMAD methodology.

18   Q.   Do you have any specific findings?

19   It appears that data limitations have led Dr. Thorpe to "jam" multiple estimation models

20   together to develop uninsurance rates which are fundamental to calculate BD/CC. As actual

21   uninsurance rates after 2006 are unavailable, Dr. Thorpe calculates "actual" uninsurance rates

22   using the 2006 rate as a base, and inflating it by the rate of compound annual growth rate of

23   actual uninsurance rates between 2002 and 2006 to forecast the "actual" uninsurance rate for

1   2008. Similarly, forecasted uninsurance rates after 2006 are unavailable. Dr. Thorpe calculates

2   "expected" uninsurance rates using the 2006 forecasted rate from his regression calculations as a

3   base, and inflating it by the rate of compound annual growth of actual uninsurance in 2002 to the

4   forecasted uinsurance in 2006 to calculate an "expected" uninsurance rate for 2008.

5   Table 12 illustrates the Thorpe methodology to forecast the "actual" uninsurance level for 2008.

6   The forecast is based on the compound annual growth rate ("CAGR") of the uninsurance level

7   from base year 2002 (13.04 percent) to 2006 (10.67 percent), the last year of data. This CAGR is

8   used to calculate "actual" uninsurance levels for 2007 and 2008 by reducing the uninsurance

9   level of 2006 for each year.

10   **Table 12:**
11

Thorpe methodology for forecasting Maine's "actual" uninsurance level		
Actual Levels		
Year	**Level**	Data Points for CAGR calculation
2002	13.04%	
2003	11.79%	
2004	11.64%	
2005	11.67%	
2006	10.67%	
2007	Forecast	
2008	Forecast	

12
13   Table 13 illustrates the Thorpe methodology to calculate the "forecasted" uninsurance

14   level for 2008. The calculations for forecasted levels are based on the CAGR of uninsurance

15   from base year 2002 of <u>actual</u> insurance level (13.04 percent) to the 2006 <u>estimated</u> uinsurance

16   level (13.53 percent –from Thorpe's regression analysis). This CAGR is then used to calculate

17   "estimated" uninsurance levels for 2007 and 2008 by reducing the estimated uninsurance level of
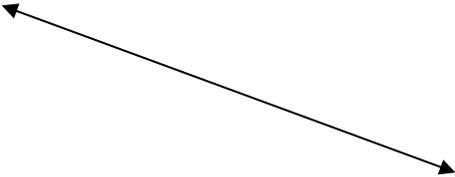
18   2006 for each year.

19

41

Table 13:

2
3

Thorpe methodology for forecasting Maine's "estimated" uninsurance level				
Actual Levels		Data Points for	**Estimated Levels**	
Year	**Level**	CAGR calculation	**Level**	**Year**
2002	13.04%			2002
2003	11.79%		14.37%	2003
2004	11.64%		13.73%	2004
2005	11.67%		13.96%	2005
2006	10.67%		13.53%	2006
2007	Forecast		Forecast	2007
2008	Forecast		Forecast	2008

4

5   Dr. Thorpe then utilizes forecasted "actual" and forecasted "estimated" uninsurance

6 levels to determine the BD/CC. For each level, he multiplies the uninsurance level by Maine's

7 population to assess a number of uninsured Mainers. Thorpe then multiplies uninsured Mainers

8 by $893.25 (his assessment of BDCC for each uninsured Mainer) to determine BDCC for each

9 scenario. Finally, he subtracts the "actual" BDCC from the "Dirigo" BDCC to assess savings.

10   I note two key concerns with this approach. The first concern is that the CAGR used to

11 calculate the forecasted estimated uninsurance level utilizes the 2002 actual level as a base. This

12 likely has the effect of reducing the level of decrease in the CAGR used to forecast the estimated

13 levels of 2007 and 2008 uninsurance. As a result, the forecasted uninsurance level would be

14 overstated as would the assessment of any savings.

15   The second, and more important concern is that Thorpe uses a comparison of the

16 forecasted 2008 actual uninsurance level to the forecasted 2008 expected uninsurance level to

17 drive his estimate of the number of the increased insured due to Dirigo. This produces an

18 overestimate if there is a 2002 baseline difference between the actual percent uninsured and the

19 estimated percent uninsured. For instance, in 2003, the ratio of the expected percent uninsured to

20 the actual percent uninsured is 1.218 (14.37 / 11.79), or a 21.9% difference. The comparable

1   2008 estimate is 42.8% (13.78 / 9.65). Even assuming that Dr. Thorpe's methodology is valid –

2   which I previously challenged-- the difference of his differences at 20.9% (42.8% - 21.9% =

3   20.9%) would appear to be a more accurate estimate of the "Dirigo effect upon the uninsurance

4   and halve his estimates of BD/CC.

5   Q.   Would this correction be in addition to any correction identified by MEAHP witness Mr.

6   Burke?

7   A.   Yes.

8   Q.   Do you have any other concerns?

9   Dr. Thorpe appears to accept this result without evaluating the results for reasonableness.

10 For instance, his model estimates that between 19,000 and 46,911 Mainers are insured as a result

11 of the Dirigo Heath Act; he accepts these estimates despite the reality that a fewer number of

12 individuals –17,000—are covered by DirigoChoice and the Dirigo Health Act MaineCare

13 expansion. He also ignores the fact than many of the Dirigo Choice members were insured at

14 the time they enrolled, and therefore did not contribute the the reduced uninsured rate. He

15 accepts a compound annual growth rate of uninsurance derived from actual and forecasted

16 uninsurance levels over a very limited of years and without confirming that his regression model

17 is calibrated to actual levels.

18 Q.   Anything else?

19 A.   If we are able to replicate the identical results between now and the hearing, we would be

20 able to offer our additional findings.

21   **Overlap:**

22 A.   Based upon your review of the CMAD and BD/CC methodologies, do you have an

23 opinion as to whether the two savings measures overlap?

1   Q.   Yes. The broad description of the BD/CC methodology in Mr. Schramm's testimony

2   suggests that the impact of CMAD voluntary limit is one of the contributing factors in making

3   health insurance premiums more affordable, thus reducing the rate of uninsured. Because the

4   costs, charges and discharges related to the newly insured, estimated to be as high as 55,000 by

5   Dr. Thorpe, would necessarily be in the CMAD calculation, the two savings measures are

6   duplicative. As more people are uninsured.

7   Q.   Overlap somehow because if there is more volume, it will drive down the cost per

8   CMAD. Also, there will be less pressure on hospitals to cost-shift to private payers.

9   Q.   Do you adopt as part of your testimony the Exhibits you discussed, **Chamber 2 - 11**

10   A.   Yes.

11   Q.   Does this conclude your testimony?

12   A.   Yes.

13

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CERTIFICATE OF SERVICE

I, William H. Stiles, attorney for the Maine State Chamber of Commerce, hereby certify that on this date I caused to be served electronically a copy of the foregoing document upon the following:

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